A-DEC™ SERVICE GUIDE, VOLUME II

Featuring A-dec 500™ and Clinical Products

Start Here

Welcome to the online A-dec 500™ and Clinical Products service guide 2004 Edition

How to navigate

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Identification of Symbols			
	Recognized by Underwriters Laboratories Inc.® with respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1. Recognized with respect to electric shock, fire, mechanical and other specified hazards only in accordance with CAN/CSA C22.2, No. 601.1		Conforms to European Directives (refer to Declaration Statement)
			Protective earth (ground)
	UL listed to US (UL 544) and Canadian (CAN/CSA C22.2, No. 125) safety standards		Functional earth (ground)
			Attention, consult accompanying documents
	Classified by Underwriters Laboratories Inc. with respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1. Classified with respect to electric shock, fire, mechanical and other specified hazards only in accordance with CAN/CSA C22.2, No. 601.1		Type B applied part
			Class II equipment

Classification of Equipment (EN 60601-1)

Types of Shock Protection:

Class I Equipment (Dental Chairs, Dental Lights, & Power Supplies)

Class II Equipment (Chair, Wall, & Cart-Mounted Delivery Systems)

Degree of Shock Protection:

Type B Applied Part (Delivery Systems Only)

Degree of Protection Against Water Ingress:

Ordinary Equipment (All products)

Mode of Operation:

Continuous Operation (All models except Dental Chairs)

Continuous Operation with Intermittent Loading (Dental Chairs -5% duty cycle)

Environmental

For Storage:	All equipment
Temperature:	-40°C to 70°C -40°F to 158°F
Relative Humidity:	95% maximum
For Operation:	
Temperature:	10°C to 40°C 50°F to 104°F
Relative Humidity:	95% maximum

Electromagnetic Compatibility

This equipment has been tested and found to comply with the limits for medical devices in EN60601-1-2. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. Contact A-dec Customer Service, if you have any questions.

Flammable Gasses

Not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide, where such gasses may accumulate in concentration (closed space).

Warranty

A-dec warrants its products against defects in material or workmanship for one year from time of delivery. A-dec's sole obligation under the warranty is to provide parts for the repair, or at its option, to provide the replacement product (excluding labor). The buyer shall have no other remedy. All special, incidental, and coincidental damages are excluded.

Written notice of breach of warranty must be given to A-dec within the warranty period. The warranty does not cover damage resulting from improper installation or maintenance, accident or misuse. The warranty does not cover damage resulting from the use of cleaning, disinfecting or sterilization chemicals and processes. The warranty also does not cover light bulbs. Failure to follow instructions provided in the A-dec Owner's Guide (operation and maintenance instructions) may void the warranty.

A-dec warrants A-dec dental chair cylinders, both lift and tilt, for ten years from the date of purchase of the chair or the cylinder. This warranty is retroactive to A-dec chair cylinders already in the field. The warranty covers chair cylinders A-dec finds to have manufacturing related irregularities. Stool cylinders are covered under A-dec's one year warranty.

No other warranties as to merchantability or otherwise are made.

Return Merchandise

U.S. and Canadian dealers wishing to return overstock (unopened) merchandise to A-dec for credit consideration must include a copy of the original invoice number. A return authorization form from an A-dec Territory Manager must be included with serial numbered equipment or A-dec/W&H handpieces. A 15% restocking fee will be assessed.

Merchandise that cannot be returned for credit includes parts assembled to the dental unit, chair, light, or cabinet; obsolete parts; and specials. Preference Collection dental furniture cannot be returned for credit.

In the case of a defective warranty item, a copy of the replacement invoice, serial number of the unit under which it was replaced, and a description of the symptoms of the defect must be returned with the part to: A-dec Inc. 2601 Crestview Drive, Newberg, Oregon 97132, USA.

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About This Document

Welcome to the *A-dec Service Guide, Volume II*. This guide provides a complete review of the tools, maintenance, adjustments, and troubleshooting information that you will need to service, and/or install the A-dec 500 system and clinical products.

This service guide contains

- part number information on serviceable parts
- flow diagrams for the routing of tubing and wiring
- exploded part illustrations showing sequence of assembly
- step-by-step instructions for troubleshooting common problems, and
- adjustments and product maintenance information.

Intended Audience

This guide is intended for both newly trained and seasoned service technicians responsible for the installation and maintenance of A-dec products. We assume you understand the operation of dental equipment, know how to follow flow diagrams, and have performed basic maintenance on dental or medical equipment.

Conventions

A number of items and instructions appear throughout this document. The formatting conventions are designed to make it quick and easy to find and understand information.

- References to sections appear in italic type, e.g., *Identifying HVEs*
- Names of documents appear in italic type e.g., *Genuine A-dec Service Parts Catalog*
- Important supplemental information about the current topic appears as a note, e.g.,
  NOTE: Line voltage from duplex receptacle. . . .
- References to the right/left sides of the chair are from the perspective of a seated patient.

Contacting Customer Service

If you have a question that has not been addressed in this document, please contact A-dec customer service for your region. Contact information for each customer service region is as follows:

U.S. and Canada

Customer service for the U.S. and Canada is available from 5 A.M. to 5 P.M. Pacific Standard Time (PST) to answer any questions you may have about A-dec equipment. Peak business hours are between 8 A.M. and 2 P.M. PST.

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Alexandria, NSW 2015, Australia

Telephone: 61 (0)2 9699 4600

Fax: 61 (0)2 9699 4700

Web Contact

OrderNet/Partner Resources websites: www.a-dec.biz

A Suite of Service Information

As A-dec's product line has grown, so has technical support for A-dec products. The A-dec service guide has grown into a suite of service information. Separate volumes address specific product lines, making locating technical information easier. Each service guide volume clearly identifies the product family and the service information found inside.

Information Sources

There are a number of other related documents in the A-dec documentation set. These documents cover a wide range of reference information.

Genuine A-dec Parts Catalog

The *Genuine A-dec Service Parts Catalog* (P/N 85.5000.00) provides part number and ordering information for A-dec serviceable parts. This catalog details service parts for current products and products which are no longer manufactured, but still in use. Refer to this catalog, for additional details on parts highlighted in this guide.

Preference Collection Technical Packet

The *Preference Collection® Technical Packet* (P/N 86.0142.00) contains information specifically related to Preference Collection dental furniture. The content is intended to assist you in specifying plumbing, utilities, framing and construction requirements, and installation for Preference Collection.

Tech Talk

The *Tech Talk* newsletter provides information related to A-dec products, including documentation changes, product changes, product enhancements, issues, and resolutions.

A-dec Illustrated Parts Breakdown

The *A-dec Illustrated Parts Breakdown* (IPB)(P/N 85.0851.00) contains illustrated, exploded views of assemblies with part numbers and descriptions for associated parts.

Electronic Documentation

Electronic versions (PDF files) of our documentation (installation instructions, service guide, technical information) can be viewed or downloaded from the *Partner Resources* section of the A-dec website. Check this location for current detail on products and technical information.

OrderNet

OrderNet is a simple, convenient online ordering system that is available 24 hours-a-day. OrderNet can be used to place quick orders for service parts or used to configure product and prepare proposals. Order acknowledgements are emailed as soon as you place your order.

How to Locate Serial/Model Number Labels

A-dec 500 serial and model number information can be found on serial/model number labels. When you contact A-dec's customer service, the serial number will help identify the product and when it was manufactured.

Item #	Description
1	Light, underside of the flexarm
2	Delivery system, underside of the delivery system
3	Chair, chair upper structure frame, under the toeboard
4	Cuspidor, inside support center
5	Assistant's instrumentation, underside of the assistant's arm
6	Power supply, inside motor pump area

Figure 1. Serial/model number locations on A-dec 500.

The serial/model number labels for other models of lights can be found in the following locations:

Track light - on back of circuit breaker cover; *wall-mounted* - on top of circuit breaker cover or at the very base of the post on the transformer side; *Preference-mounted* - on the transformer cover underneath the x-ray cap or at the end of the post by the transformer; *ceiling-mounted* - on top of circuit breaker cover.

Serial/Model Number Labels

The example shows how to identify the model, month, and year of manufacture of the product. Each model number is identified by the "REF" number.

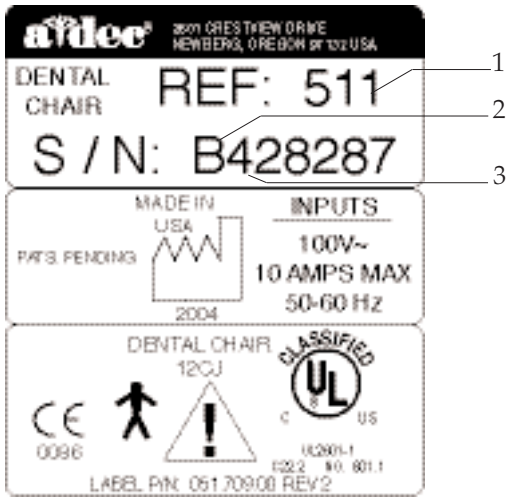

Figure 2. Serial/model number identification using an A-dec 511 chair serial/model number label as an example. (1) - Model number; (2) - The first letter of the serial number indicates the month the product was manufactured; (e.g., B is February); (3) - First digit indicates the year of manufacture (e.g., 4 is 2004).

Month Identification Chart			
A	January	G	July
B	February	H	August
C	March	I	September
D	April	J	October
E	May	K	November
F	June	L	December

Recommended Tools

The table provides information about the types of tools needed for servicing A-dec equipment.

Use this tool . . .	When . . .		Part Number
Drive air pressure gauge	adjusting handpiece drive air pressure, 0 - 60 psi (4.13 bar). (Does not fit the Borden 3-hole coupler.)		50.0271.00
Hemostat	troubleshooting or repairing a unit to stop air/water flow through tubing		009.008.00
Hex key set	servicing or installing A-dec equipment (plastic case included)		009.018.00
Loctite	installing threaded fasteners to prevent loosening		060.001.00 (Red 271) 060.002.00 (Blue 242)
O-ring tools	providing quick field repairs (fit the four smallest O-ring sizes)		009.013.00
Panel mount gauge	checking air/water pressure valves		026.118.00

Use this tool . . .	When . . .		Part Number
Silicone lubricant (high quality silicone base grease, pkg 6)	lubricating internal moving parts such as O-rings, oral evacuator valves, and bushings		98.0090.01
Sleeve tool	securing 1/4" tubing sleeves and 1/8" uni-clamps		98.0072.00
Snap ring tool	installing and removing internal and external snap rings (fits all snap rings used in A-dec equipment)		009.007.00
Tubing stripper	installing handpiece tubing used to separate the extruded air and water lines		009.035.00
Umbilical stringer	stringing additional tubing or wiring into existing umbilical assemblies (12' [3.66 m] stringer with threading holes on both ends)		009.015.00
Valve test syringe	making quick tests of pilot operated valves. Use to apply a static pressure of 5 -75 psi (.34 - 5.17 bar).		98.0050.01

How to Identify A-dec Tubing

There are four sizes of tubing used in A-dec products; 1/8", 1/4", 3/8", and 5/16".

A-dec 500 Tubing

The A-dec 500 product uses the new 5/16" tubing size for all high flow air and water applications. Tubing functions are identifiable by reading the tubing color and tracer markings.

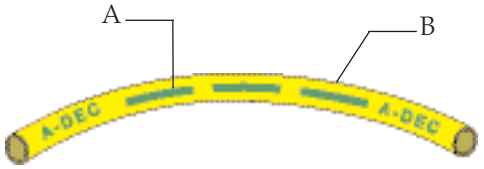

Figure 3. Tracer patterns for identifying A-dec tubing. (A) tracer pattern identifies the specific tubing; (B) tubing color is the color of the tubing material

Tubing Function	Description	Tubing Color/Tracer	Part Number
Chip Blower/Accessory Button	Chip blower air — 1/8" OD brown/white long dash		036.014.02
Air Coolant Signal	Air coolant signal air from foot control, signal air for cuspidor cup filler and vacuum actuator — 1/8" OD, green/white long dash		036.006.03
Water Coolant Signal	Water coolant signal air from foot control, signal air for cuspidor bowl rinse — 1/8" OD, green/white short dash		036.018.03
Unregulated Air	Unregulated air to flexarm brake — 1/8" OD, black		036.020.02

Tubing Function	Description	Tubing Color/Tracer	Part Number
Water Coolant Signal Air	Signal air (clear) from foot control valve to wet/dry toggle — 1/8" OD, clear		024.015.04
Water Supply, Cold Water (regulated)	Oral cavity water — 1/8" OD, blue		036.004.03
Oral Cavity Water	Syringe water, with/without water heater — 1/8" OD, red		036.005.03
Unregulated Air, Master Air	Continuous, filtered, unregulated air — 1/8" OD from the air filter regulator to On/Off toggle, yellow/red stripe		036.013.03
Pilot Air	Filtered unregulated air controlled by master On/Off toggle — 1/8" OD, yellow/red dash		036.009.04

Tubing Function	Description	Tubing Color/Tracer	Part Number
Regulated Air	Continuous, filtered, regulated air — 1/8" OD, yellow		036.003.03
Miscellaneous	Miscellaneous line for use with A-dec authorized accessories — 1/8" OD, white		036.019.03
Hydraulic Fluid	Low pressure hydraulic system supply for chair — 3/8" OD, clear		036.035.00
Drive Air	Drive air from foot control to delivery system — 5/16" OD orange		036.115.00
Regulated Air	Supplies regulated air to the flush toggle and syringe — 5/16" OD yellow		036.114.00
Water Supply	Water bottle, and city water — 5/16" OD blue		036.116.00

Handpiece Tubing

A-dec 500 product uses a silicone handpiece tubing. The silicone handpiece tubing uses a European color code for air (blue) and water (green) that differs from the current U.S. standard.

Color	Function
Clear	Drive air
Red	Exhaust
Blue	Air coolant
Green	Water coolant

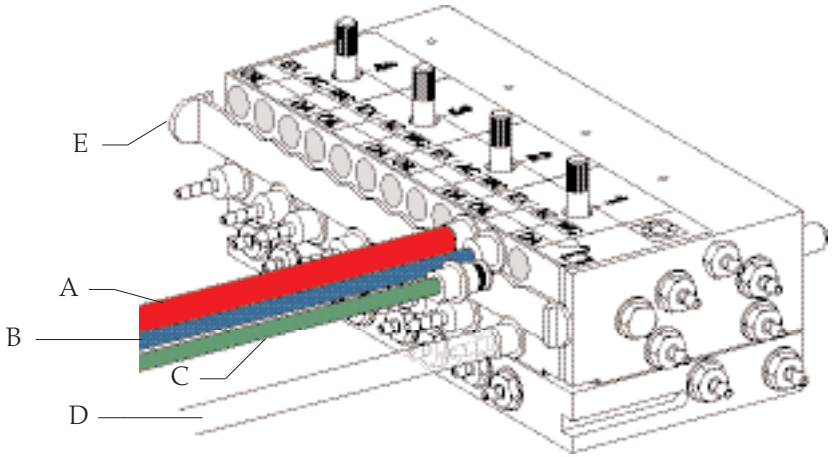

Figure 4. Silicone tubing connections. (A) exhaust; (B) air coolant; (C) water coolant; (D) drive air; (E) slide lock

Quick-Connect Fittings

Some tubing connections in the A-dec 500 equipment use quick-connect fittings. These fittings provide fast, secure, push-on installation of tubing. These quick-connects also make removal of tubing during servicing easy.

How to Use Quick-Connect Fittings

Connect Tubing

1. Cut the tubing square, to ensure a secure connection.

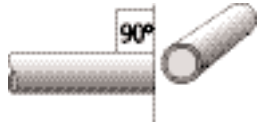

Figure 5. Making a square cut.

2. Push the tubing into the connector until it can go no further.

Figure 6. Pushing the tubing into the fitting.

3. Pull gently on the tubing to verify grip action.

Disconnect Tubing

Depressurize the unit. Push and hold the release ring on the connector. Remove the tubing from the connector.

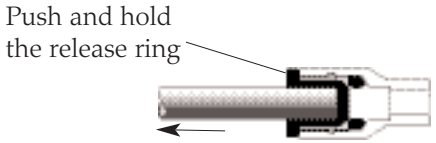

Figure 7. Removing the tubing from the fitting.

Data Communication System (DCS)

A-dec 500 equipment uses an electronic communication tool called the Data Communication System. The DCS allows each module to communicate with each other, and automatically detects when new ones are added. For example, when connecting a cuspidor to the system, the DCS will automatically recognize the cuspidor module without having to program or change any settings.

Modules can be plugged into any of the data line connectors on the circuit board. The circuit board recognizes which module has been plugged in and allows operation of that module to begin. Should a module malfunction or fail to work, the DCS will maintain service to the rest of the modules. Other modules will continue to function in spite of the one that has failed.